

DOCKET NO: 210149US0PCT



IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF

YUKIO MITSU HAYASHI, ET AL.

SERIAL NO: 09/868,920

FILED: JULY 25, 2001

FOR: SOFTENER COMPOSITION

:

: EXAMINER: HARDEE, J. R.

:

: GROUP ART UNIT: 1751

:

AMENDMENT AND REQUEST FOR RECONSIDERATION

COMMISSIONER FOR PATENTS  
ALEXANDRIA, VIRGINIA 22313

SIR:

Responsive to the Official Action of May 12, 2003, reconsideration of the above-identified application is respectfully requested in view of the following amendment and remarks.

**Amendments to the Claims** are reflected in the listing of claims which begins on page 2 of this paper.

**Request for Reconsideration** begins on page 12 of this paper.

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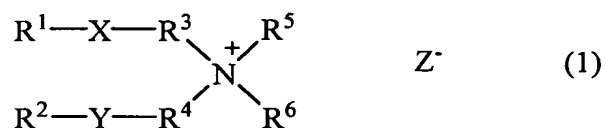
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IN THE CLAIMS

Please amend the claims as follows:

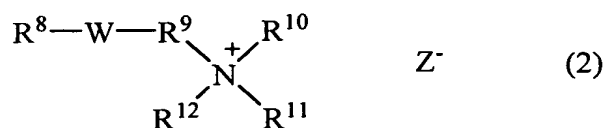
Claim 1 (currently amended): A softener composition comprising:

(a) a quaternary ammonium compound represented by the formula (1):



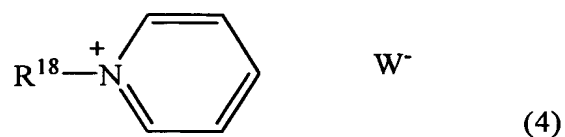
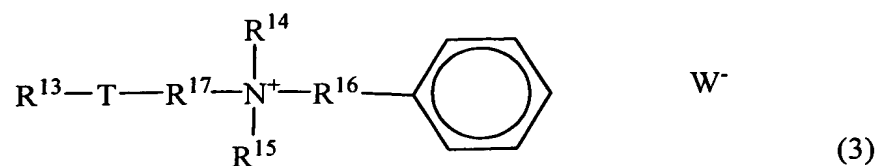
wherein R<sup>1</sup> and R<sup>2</sup> independently represent a C<sub>12-22</sub> alkyl or alkenyl group, X and Y are independently -COO-, -CONR<sup>7</sup>-, -OCO- or -NR<sup>7</sup>CO-, provided that at least one of X and Y is -COO- or -OCO-, R<sup>7</sup> represents a hydrogen atom or a C<sub>1-3</sub> alkyl or hydroxyalkyl group, R<sup>3</sup> and R<sup>4</sup> independently represent a C<sub>1-5</sub> alkylene group, R<sup>5</sup> and R<sup>6</sup> represent a C<sub>1-3</sub> alkyl or hydroxyalkyl group or R<sup>1</sup>-X-R<sup>3</sup>- and Z<sup>-</sup> is an anionic group,

(b) a quaternary ammonium compound represented by the formula (2):

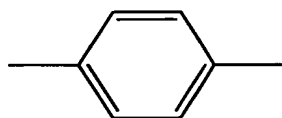


wherein R<sup>8</sup> represents a C<sub>12-22</sub> alkyl or alkenyl group, W is a group selected from -COO-, -CONR<sup>7</sup>-, -OCO- and NR<sup>7</sup>CO-, R<sup>7</sup> represents a hydrogen atom or a C<sub>1-3</sub> alkyl or hydroxyalkyl group, ~~preferably a hydrogen atom,~~ R<sup>9</sup> represents a C<sub>1-5</sub> alkylene group, R<sup>10</sup> and R<sup>11</sup> represent a C<sub>1-3</sub> alkyl or hydroxyalkyl group, R<sup>12</sup> represents a C<sub>1-3</sub> alkyl group or -R<sup>26</sup>-OH, R<sup>26</sup> is a C<sub>1-5</sub> alkylene group and Z<sup>-</sup> is an anionic group, and  
 a compound selected from the following component (c) or (d):

(c) 0.1 to 15% by weight of a compound represented by formula (3) and/or formula (4):

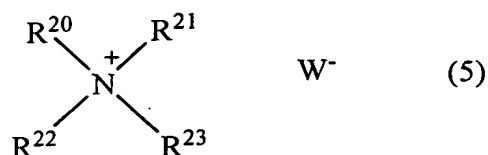


wherein  $\text{R}^{13}$  and  $\text{R}^{18}$  independently represent a  $\text{C}_{5-19}$  alkyl or alkenyl group,  $\text{R}^{14}$  and  $\text{R}^{15}$  independently represent a  $\text{C}_{1-3}$  alkyl or hydroxyalkyl group, and T is  $-\text{COO}-$ ,  $-\text{OCO}-$ ,  $-\text{CONH}-$ ,  $-\text{NHCO}-$ ,



or a linkage,  $\text{R}^{16}$  represents a  $\text{C}_{1-3}$  alkylene group,  $\text{R}^{17}$  represents a  $\text{C}_{1-6}$  alkylene group or  $-(\text{O}-\text{R}^{19})_n-$ ,  $\text{R}^{19}$  is ethylene group or propylene group and n is a number of 1 to 10 and  $\text{W}^{-}$  is an anionic group, and

(d) 0.01 to 15% by weight of a compound represented by formula (5):

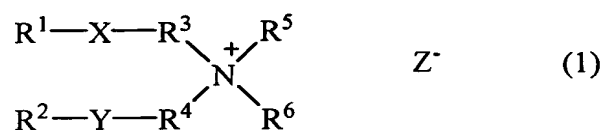


wherein 2 or 3 groups out of  $R^{20}$ ,  $R^{21}$ ,  $R^{22}$  and  $R^{23}$  represent a  $C_{8-12}$  alkyl group, the remainder of them represent a  $C_{1-3}$  alkyl group, a  $C_{1-3}$  hydroxyalkyl group or a  $C_{7-15}$  arylalkyl group and  $Z^-$  is an anionic group.

Claim 2 (Original): The softener composition according to claim 1, which further comprises (e) a nonionic surfactant

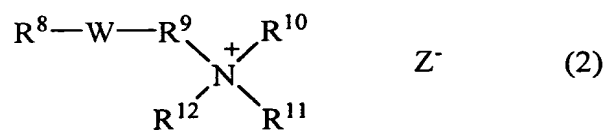
Claim 3 (Currently amended): A softener composition comprising:

(a) a quaternary ammonium compound represented by the formula (1):



wherein  $R^1$  and  $R^2$  independently represent a  $C_{12-22}$  alkyl or alkenyl group, X and Y are independently  $-COO-$ ,  $-CONR^7-$ ,  $-OCO-$  or  $-NR^7CO-$ , provided that at least one of X and Y is  $-COO-$  or  $-OCO-$ ,  $R^7$  represents a hydrogen atom or a  $C_{1-3}$  alkyl or hydroxyalkyl group,  $R^3$  and  $R^4$  independently represent a  $C_{1-5}$  alkylene group,  $R^5$  and  $R^6$  represent a  $C_{1-3}$  alkyl or hydroxyalkyl group or  $R^1-X-R^3-$  and  $Z^-$  is an anionic group.

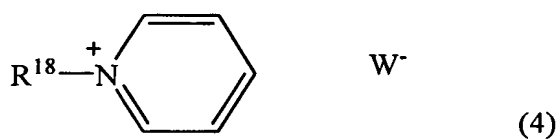
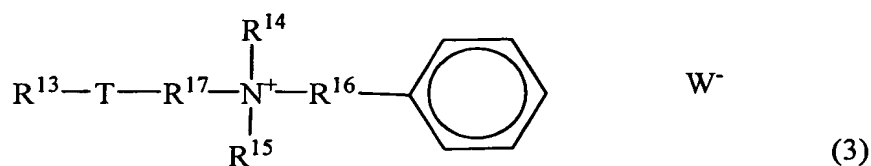
(b) a quaternary ammonium compound represented by the formula (2):



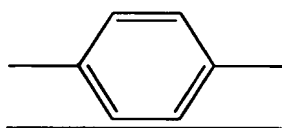
wherein  $R^8$  represents a  $C_{12-22}$  alkyl or alkenyl group, W is a group selected from  $-COO-$ ,

—CONR<sup>7</sup>—, —OCO— and NR<sup>7</sup>CO—, R<sup>7</sup> represents a hydrogen atom or a C<sub>1-3</sub> alkyl or hydroxyalkyl group, —R<sup>9</sup> represents a C<sub>1-5</sub> alkylene group, R<sup>10</sup> and R<sup>11</sup> represent a C<sub>1-3</sub> alkyl or hydroxyalkyl group, R<sup>12</sup> represents a C<sub>1-3</sub> alkyl group or —R<sup>26</sup>—OH, R<sup>26</sup> is a C<sub>1-5</sub> alkylene group and Z<sup>-</sup> is an anionic group, and a compound selected from the following component (c) or (d):

(c) 0.1 to 15% by weight of a compound represented by formula (3) and/or formula (4):

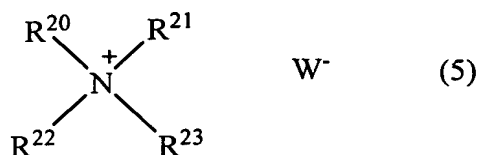


wherein R<sup>13</sup> and R<sup>18</sup> independently represent a C<sub>5-19</sub> alkyl or alkenyl group, R<sup>14</sup> and R<sup>15</sup> independently represent a C<sub>1-3</sub> alkyl or hydroxyalkyl group, and T is —COO—, —OCO—, —CONH—, —NHCO—,



or a linkage, R<sup>16</sup> represents a C<sub>1-3</sub> alkylene group, R<sup>17</sup> represents a C<sub>1-6</sub> alkylene group or —(O—R<sup>19</sup>)<sub>n</sub>—, R<sup>19</sup> is ethylene group or propylene group and n is a number of 1 to 10 and W<sup>-</sup> is an anionic group, and

(d) 0.01 to 15% by weight of a compound represented by formula (5):

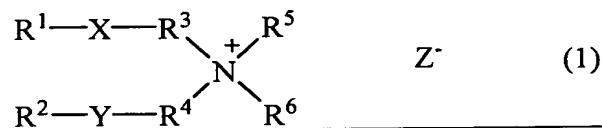


wherein 2 or 3 groups out of  $\text{R}^{20}$ ,  $\text{R}^{21}$ ,  $\text{R}^{22}$  and  $\text{R}^{23}$  represent a  $\text{C}_{8-12}$  alkyl group, the remainder of them represent a  $\text{C}_{1-3}$  alkyl group, a  $\text{C}_{1-3}$  hydroxyalkyl group or a  $\text{C}_{7-15}$  arylalkyl group and  $\text{Z}^-$  is an anionic group

The softener composition according to claim 1, which further comprises 0.1 to 5% by weight of (f) a  $\text{C}_{8-22}$  fatty acid or a salt thereof.

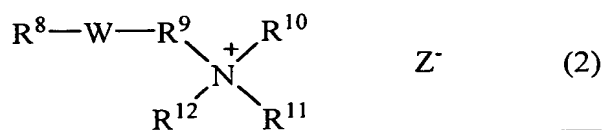
Claim 4 (Currently amended): A softener composition comprising:

(a) a quaternary ammonium compound represented by the formula (1):



wherein  $\text{R}^1$  and  $\text{R}^2$  independently represent a  $\text{C}_{12-22}$  alkyl or alkenyl group, X and Y are independently  $-\text{COO}-$ ,  $-\text{CONR}^7-$ ,  $-\text{OCO}-$  or  $-\text{NR}^7\text{CO}-$ , provided that at least one of X and Y is  $-\text{COO}-$  or  $-\text{OCO}-$ ,  $\text{R}^7$  represents a hydrogen atom or a  $\text{C}_{1-3}$  alkyl or hydroxyalkyl group,  $\text{R}^3$  and  $\text{R}^4$  independently represent a  $\text{C}_{1-5}$  alkylene group,  $\text{R}^5$  and  $\text{R}^6$  represent a  $\text{C}_{1-3}$  alkyl or hydroxyalkyl group or  $\text{R}^1\text{—X—R}^3-$  and  $\text{Z}^-$  is an anionic group,

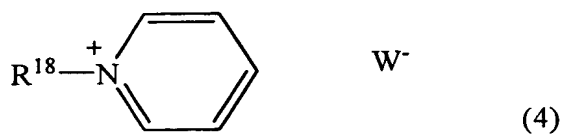
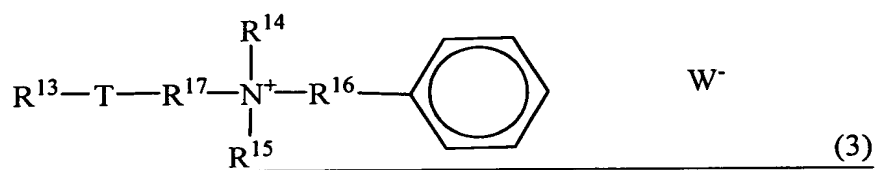
(b) a quaternary ammonium compound represented by the formula (2):



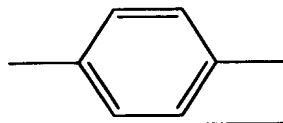
wherein  $R^8$  represents a  $C_{12-22}$  alkyl or alkenyl group, W is a group selected from  $-\text{COO}-$ ,  $-\text{CONR}^7-$ ,  $-\text{OCO}-$  and  $\text{NR}^7\text{CO}-$ ,  $R^7$  represents a hydrogen atom or a  $C_{1-3}$  alkyl or hydroxyalkyl group,  $R^9$  represents a  $C_{1-5}$  alkylene group,  $R^{10}$  and  $R^{11}$  represent a  $C_{1-3}$  alkyl or hydroxyalkyl group,  $R^{12}$  represents a  $C_{1-3}$  alkyl group or  $-\text{R}^{26}-\text{OH}$ ,  $R^{26}$  is a  $C_{1-5}$  alkylene group and  $Z^-$  is an anionic group, and

a compound selected from the following component (c) or (d):

(c) 0.1 to 15% by weight of a compound represented by formula (3) and/or formula (4):

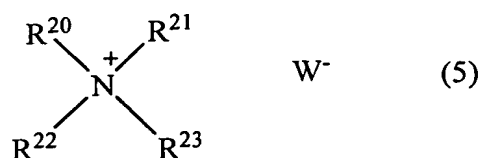


wherein  $R^{13}$  and  $R^{18}$  independently represent a  $C_{5-19}$  alkyl or alkenyl group,  $R^{14}$  and  $R^{15}$  independently represent a  $C_{1-3}$  alkyl or hydroxyalkyl group, and T is  $-\text{COO}-$ ,  $-\text{OCO}-$ ,  $-\text{CONH}-$ ,  $-\text{NHCO}-$ ,



or a linkage,  $R^{16}$  represents a  $C_{1-3}$  alkylene group,  $R^{17}$  represents a  $C_{1-6}$  alkylene group or  $-(\text{O}-\text{R}^{19})_n-$ ,  $R^{19}$  is ethylene group or propylene group and n is a number of 1 to 10 and  $\text{W}^-$  is an anionic group, and

(d) 0.01 to 15% by weight of a compound represented by formula (5):



wherein 2 or 3 groups out of R<sup>20</sup>, R<sup>21</sup>, R<sup>22</sup> and R<sup>23</sup> represent a C<sub>8-12</sub> alkyl group, the remainder of them represent a C<sub>1-3</sub> alkyl group, a C<sub>1-3</sub> hydroxyalkyl group or a C<sub>7-15</sub> arylalkyl group and Z<sup>-</sup> is an anionic group.

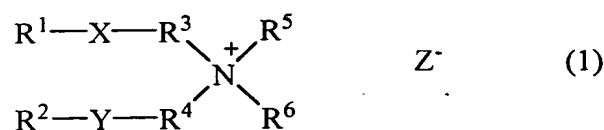
~~The softener composition according to Claim 1~~ which further comprises (e) a nonionic surfactant and 0.1 to 5% by weight of (f) a C<sub>8-22</sub> fatty acid or salt thereof.

Please add new claims 5-20 as follows:

Claim 5 (new) The softener composition of claim 1, where R<sup>7</sup> is a hydrogen atom.

Claim 6 (new) A softener composition comprising:

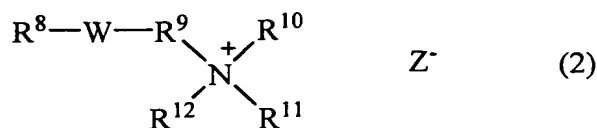
(a) a quaternary ammonium compound represented by the formula (1):



wherein R<sup>1</sup> and R<sup>2</sup> independently represent a C<sub>12-22</sub> alkyl or alkenyl group, X and Y are independently —COO—, —CONR<sup>7</sup>—, —OCO— or —NR<sup>7</sup>CO—, provided that at least one of X and Y is —COO— or —OCO—, R<sup>7</sup> represents a hydrogen atom or a C<sub>1-3</sub> alkyl or hydroxyalkyl group, R<sup>3</sup> and R<sup>4</sup> independently represent a C<sub>1-5</sub> alkylene group, R<sup>5</sup> and R<sup>6</sup> represent a C<sub>1-3</sub> alkyl or hydroxyalkyl group or R<sup>1</sup>—X—R<sup>3</sup>— and Z<sup>-</sup> is an anionic group,

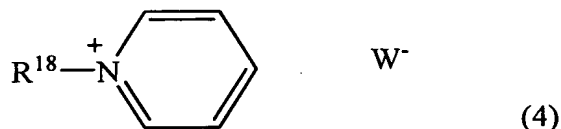
(b) a quaternary ammonium compound represented by the formula (2):





wherein  $\text{R}^8$  represents a  $\text{C}_{12-22}$  alkyl or alkenyl group, W is a group selected from  $-\text{COO}-$ ,  $-\text{CONR}^7-$ ,  $-\text{OCO}-$  and  $\text{NR}^7\text{CO}-$ ,  $\text{R}^7$  represents a hydrogen atom or a  $\text{C}_{1-3}$  alkyl or hydroxyalkyl group,  $-\text{R}^9$  represents a  $\text{C}_{1-5}$  alkylene group,  $\text{R}^{10}$  and  $\text{R}^{11}$  represent a  $\text{C}_{1-3}$  alkyl or hydroxyalkyl group,  $\text{R}^{12}$  represents a  $\text{C}_{1-3}$  alkyl group or  $-\text{R}^{26}-\text{OH}$ ,  $\text{R}^{26}$  is a  $\text{C}_{1-5}$  alkylene group and  $\text{Z}^-$  is an anionic group, and

(c) 0.1 to 15% by weight of a compound represented by formula (4):



wherein  $\text{R}^{18}$  independently represent a  $\text{C}_{5-19}$  alkyl or alkenyl group, and  $\text{W}^-$  is an anionic group.

Claim 7 (new) The softener composition of claim 3, which further comprises (e) a nonionic surfactant.

Claim 8 (new) The softener composition of claim 1, which comprises 3-50 % by weight of component (a) 7,

Claim 9 (new) The softener composition of claim 1, which comprises 0.5 to 10 % by weight of component (b).

Claim 10 (new) The softener composition of claim 1, wherein a weight ratio of component (a)/component (b) is 80/20 to 99/1.

Claim 11 (new) The softener composition of claim 1, comprising component (c) in an amount of 0.1 to 15% by weight.,

Claim 12 (new) The softener composition of claim 1, comprising component (c) in a weight ratio of (c)/(a) of 1/30 to 1/1.

Claim 13 (new) The softener composition of claim 1, comprising component (d) in an amount of 0.1 to 15% by weight.

Claim 14 (new) The softener composition of claim 1, comprising component (d) in a weight of (a)/(d) of 50/1 to 2/1.

Claim 15 (new) The softener composition of claim 1, comprising 40 to 90 % by weight of water.

Claim 16 (new) The softener composition of claim 1, having a pH value of 1 to 6.

Claim 17 (new) The softener composition of claim 2, comprising 0.5 to 10% by weight of said nonionic surfactant.

Claim 18 (new) The softener composition of claim 1, further comprising 0 to 1,000 ppm of an inorganic salt. .

Claim 19 (new) The softener composition of claim 1, further comprising a solvent selected from the group consisting of ethanol, isopropanol, glycerine, ethylene glycol, propylene glycol, diethylene glycol, dipropylene glycol, polyoxyethylene phenyl ether and a mixture thereof.

Claim 20 (new) The softener composition of claim 19, wherein said solvent is present in an amount of 0 to 20 % by weight.

#### SUPPORT FOR THE AMENDMENT

Support for the amendment to claims 3 and 4 is found in claims 1, 3 and 4 as originally presented. Support for claim 5 is found in claim 1 as originally presented. Support for claim 6 is found in claim 1 as originally presented. Support for claim 7 is found in claim 2 as originally presented. Support for claim 8 is found on page 7, lines 4-6 of the specification. Support for claim 9 is found on page 7, line 8 of the specification. Support for

claim 10 is found on page 7, line 11 of the specification. Support for claim 11 is found on page 7, line 14 of the specification. Support for claim 12 is found on page 7, line 18 of the specification. Support for claim 13 is found on page 7, line 22 of the specification. Support for claim 14 is found on page 7, line 24 of the specification. Support for claim 15 is found on page 8, line 6 of the specification. Support for claim 16 is found on page 8, line 11 of the specification. Support for claim 17 is found on page 9, line 21 of the specification. Support for claim 18 is found on page 10, lines 18-20 of the specification. Support for claim 19 is found on page 10, line 25 through page 12, line 2 of the specification. Support for claim 20 is found on page 11, lines 3-4 of the specification.

No new matter would be added to this application by entry of this amendment.

Upon entry of this amendment, claims 1-20 will now be active in this application

REQUEST FOR RECONSIDERATION

The present invention is directed to a softener composition.

Applicants wish to thank examiner Hardee for the helpful and courteous discussion held with Applicants' U.S. representatives on June 6, 2003. At that time, Applicants' U.S. representative argued that unexpected improvements in performance were observed through the combination of quaternary ammonium compounds of formula (1) and formula (2) and that such a result was nowhere disclosed or suggested in the cited prior art of record. The following is intended to expand upon the discussion with the Examiner.

Applicants would also like to thank examiner Hardee for indicating that claims 3 and 4 are allowable. Claims 3 and 4 have now been rewritten in independent form, including all of the limitations of the independent claim. Claims 3 and 4 may now be passed to issue.

Quaternary ammonium salt compounds have been used in fabric softener compositions. Performance in terms of softening properties and antimicrobial effects have not been entirely satisfactory. Accordingly, compositions demonstrating good softening effects and antimicrobial performance, are sought.

The present invention addresses this problem by providing a softener composition comprising quaternary ammonium compounds of formula (1) and (2) in conjunction with a component (c) or (d), which exhibit good softness and good odor suppressing action. Such a composition is nowhere disclosed or suggested in the cited prior art of record.

As evidence of improved softness and odor control observed by the combination of quaternary ammonium compounds of formula (1) and (2), Applicants enclose herewith the Declaration of Ms. Noriko Yamaguchi, a named inventor of the above-identified application. Ms. Yamaguchi has compared the odor and softening performance of inventive compositions containing a mixture of quaternary ammonium compounds of formula (1) and (2) as compared with compositions containing the same weight percent of only a quaternary

ammonium compound of formula (1). For the Examiner's convenience, the data is reproduced below:

			Tested Products			
			composition 1	composition 2	composition 3	composition 4
			Invention product 4 of Table 1	Comparative product 7	Invention product 13 of Table 4	Comparative product 5
Softener Composition	Component (wt%)	(a-3)	15	16.5		
		(a-6)			12	14
		(b-2)	1.5		2	
		(c-1)	5	5		
		(d-1)			5	5
		(e-1)	2	2		
		(e-2)			5	5
		(f-1)	1	1		
		(f-4)			2	2
		(g-1)	1	1		
		(g-2)	100 ppm	100 ppm	100 ppm	100 ppm
		(g-3)	3	3		
		(h-1)	10 ppm	10 ppm	10 ppm	10 ppm
		(h-2)	50 ppm	50 ppm		
		(h-3)	0.1	0.3	0.3	0.3
		deionized water	balance	balance	balance	balance
		Total	100	100	100	100
		pH (20°C)		3.5	3.5	2.5
Smell	Clothes after drying	O	Control	O	Control	
	Clothes after worn	O	Control	O	Control	
Softening Performance			O	Control	O	Control

The data demonstrates, as compared with compositions containing only the quaternary ammonium compound of formula (1), that improved odor after drying and after being worn, as well as improved softening performance, results from compositions in which **both** quaternary ammonium compounds of formula (1) and (2) are present. As there is no suggestion in the prior art of record for improved odor and softness by a combination of quaternary ammonium compounds, as claimed, the present invention is clearly not obvious over the cited references.

The rejection of Claims 1 and 2 under 35 U.S.C. § 103(a) over Rusche et al. (U.S. 5,686,376) is respectfully traversed.

Rusche simply discloses a method for improving the color of dyed fabrics for the whiteness of white fabrics which have been laundered in a conventional manner in water which contains copper or nickel ions, by rinsing the fabrics in water which contains a chelating agent for copper and/or nickel (column 2, lines 38-43). Fabric softening compositions are generally described at column 9, beginning at line 37, however, fails to specifically describe the softener composition comprising a combination of **both** quaternary ammonium compounds formula (1) and formula (2) as claimed. Applicants have provided a direct comparison of the performance of a softener composition according to the present invention indicating both quaternary ammonium compound of formula (1) and (2), as compared with an equivalent amount of the quaternary ammonium compound of formula (1). Such performance clearly demonstrates the improved performance resulting from the combined use of quaternary ammonium compounds of formula (1) and formula (2).

Since the cited prior art of record nowhere discloses or suggests the combination of quaternary ammonium compounds of formula (1) and formula (2), and Applicants have demonstrated an improvement in performance when the two compounds are present as compared with use of the single compound, the present invention is clearly not obvious from the cited prior art of record and accordingly withdrawal of the rejection under 35 U.S.C. § 103(a) is respectfully requested.

Claim 6

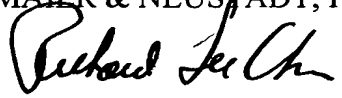
This embodiment of the present invention contains, in addition to the quaternary ammonium compounds of formula (1) and (2), a compound of formula (4) as component (c). A compound of formula (4) is nowhere disclosed or suggested in the primary reference and accordingly claim 6 is novel and not obvious over the cited reference.

Application No. 09/868,920  
Reply to Office Action of May 12, 2003

Applicants submit that this application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.



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Registration No. 34,305